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by

Ye.P. Veselov

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U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*<u>ye</u> initially, after vowels, and after ъ, ь; <u>e</u> elsewhere.
When written as ё in Russian, transliterate as yё or ё.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	$\sinh^{-1}$
cos	cos	ch	cosh	arc ch	$\cosh^{-1}$
tg	tan	th	tanh	arc th	$\tanh^{-1}$
ctg	cot	cth	coth	arc cth	$\coth^{-1}$
sec	sec	sch	sech	arc sch	sech^{-1}
cosec	csc	csch	csch	arc csch	csch^{-1}

Russian	English
rot	curl
lg	log

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THE EFFECT OF RELIEF ON THE WIND FIELD IN THE REGION OF THE WHITE SEA.

Ye. P. Veselov.

At present there is in the sufficient degree a developed theory of calculation of wind velocity according to the pressure field or geopotential of gravitational force for the layers of air where friction virtually is absent. However, during calculation of the velocity of ground wind appear many difficulties, connected with the impossibility of a strict account of frictional force in view of the heterogeneity of the underlying surface. Especially large difficulties appear during calculation of wind velocity in the regions with complex topographic conditions. It is necessary to resort to different kind for simplifications. One of such simplifications is the utilization of empirical coefficients for different points or regions which indirectly consider the local special features/peculiarities of relief. Let us show this based on the example of coast of the White Sea, which is characterized by the

abundance of bays/gulfs, bays and river valleys. The height of coast varies from several meters above sea level in its southern part to 550 m and more in the region of Kandalaksha bay/gulf.

The average/mean ratios accepted as the empirical coefficients of the velocities of actual and geostrophic wind $\frac{C_\Phi}{C_r} = k$ were calculated for 28 points, located on coast and islands of the White Sea, in eight main trends of geostrophic wind (isobars) [1, 2, 3]. This principle of the determination of coefficients of k was caused by the special features/peculiarities of relief in the vicinities of the points in question. With the same value of pressure gradient Δp_0 are observed essential differences in wind velocity. To what extent are great these differences, it is possible to see, after comparing between themselves wind velocities, calculated by the formula

$$C_\Phi \approx 2k\Delta p_0, \quad (1)$$

obtained by the author for the area of the White Sea earlier [1, 2].

The winds, which blow from sea, as a rule, are more strong than coasts, since the inhibiting effect on the wind of frictional force on dry land becomes apparent to the much larger degree, than at sea. This position is confirmed by the comparison of corresponding data. Thus, on the Terskiy coast of the White Sea (Fig. 1) maritime (southern) wind velocity on the average 2 m/s is more than the velocity of coast. On the Karelian and Kanin coasts,

and also in the region of Zhizhgin Island (in southern part of the sea), the velocity of the maritime wind (respectively eastern, western and northern) is 3 m/s more than the velocity of coastal wind. On the winter shore (Zimnegorsk beacon) the excess of maritime (western) wind velocity above the velocity of coastal reaches in average/mean 7.5 m/s.

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High value has the value of the dispersal/acceleration of the wind above the open part of sea. It proves to be that in region Kanin Nos at one and the same values of pressure gradient the winds northern quarter, which pass above the water of Arctic Ocean the distances about several thousand kilometers, more strong than western passing above the high sea of altogether only 200 km, on the average on 4-6 m/s.

The known strengthening of the wind with air motion tangentially to the convex shore line, especially to the capes, with the arrangement of land to the right of flow [4] becomes apparent in regions Kanin Nos and Zimnegorsk beacon with the winds of the southeastern and southern directions, in the regions of Svyatoy Nos, Terskiy-Orel (in cape Orel), that of the Abramovsk beacon and others - with the northwestern wind.

The brokenness of high shores by river valleys contributes to the supplementary strengthening of the wind, which blows along the valleys. Therefore in Svyatoy Nos (in the discharge opening of the Iokan'gi River) and Terskiy-Orel beacon (in the discharge opening of the Ponoy River) coast (western) winds approach in the intensity maritime ones.

A similar tendency toward levelling of velocities of coast (southeastern) and maritime (northwestern) wind velocity is observed in the region of st. Kanin Nos. The station is located on the northwestern slope of emerging to sea of ridge Kanin Kamen' with the highest mark 177 m.

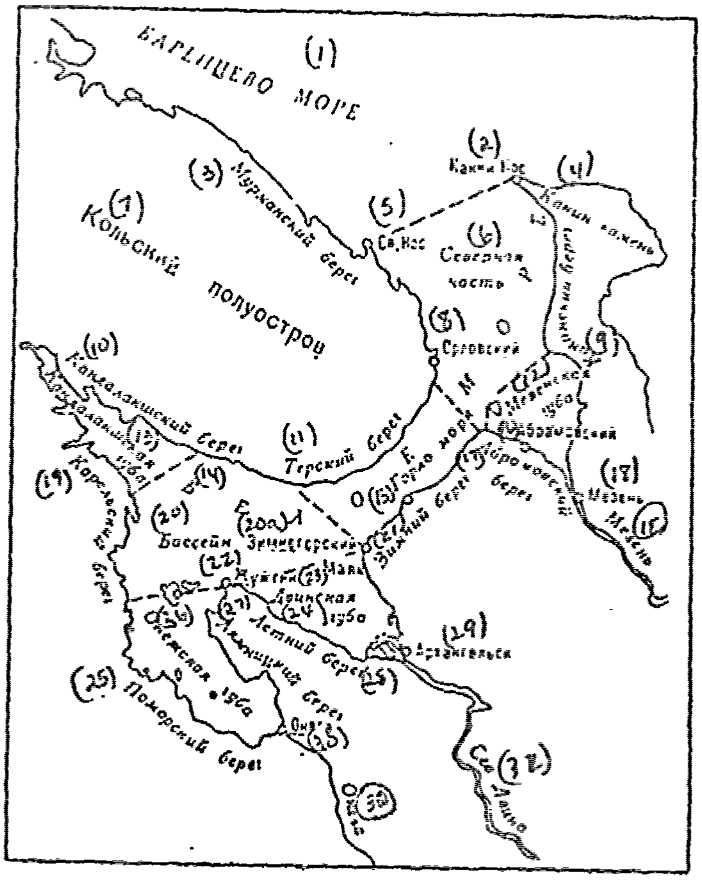

Fig. 1. Diagram of the area of the White Sea.

Key: (1). Barents Sea. (2). Kanin Nos. (3). Murmansk shore. (4). Kanin Kamen'. (5). Svyatoy Nos. (6). Northern part. (7). Kola peninsula. (8). Orel. (9). Konin shore. (10). Kandalaksha shore. (11). Terskiy coast. (12). Mezen' inlet. (13). Kandalaksha Bay. (14). White Sea. (15). Throat of sea. (16). Abramovsk. (17). Abramovsk shore. (18). Mezen'. (19). Karelian shore. (20). Basin. (20a).

Zimnegorsk beacon. (21). Winter shore. (22). Zhuzhgin. (23). [no key]. (24). Dvina inlet. (25). Seacoast shore. (26). Onega Bay. (27). Lyamnitssk shore. (28). Letnyy shore. (29). Arkhangelsk. (30). Onega. (31). Severnaya Dvina.

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The southeastern wind obtains here, particularly in winter, supplementary acceleration due to the gravitational runoff of air along the slope. Analogous phenomenon, apparently, leads to levelling of the northwestern and southeastern wind velocity in the Kandalaksha bay/gulf.

The comparison of wind velocities in the points, which are located on the high Terskiy, Kanin and Zimnyy shores with the separate elevations 100-200 m, and in the regions of Onega, Dvina and the southern part of the Mezen' bays/gulfs where the coast is low, shows that orography contributes to considerable intensification of the wind. For example, wind velocities of northeastern quarter in region Kanin Nos on the average on 6.5 m/s are more than in Mezen', and western wind velocity in Zimnegorsk beacon on 13-15 m/s is more than in Onega. The velocity of the wind in the region st. Zimnegorsk beacon, arranged/located on the height of 81 m above sea level, approximates the gradient wind speed.

The configuration of coasts and their topography, orientation of bays/gulfs and throat of the White Sea strain airflow in friction layer, changing direction of its motion and amplifying the wind to the side of the contractors of the bays/gulfs. In the Onega, Dvina and Mezen' bays/gulfs for this reason most strong are the northwestern winds. The northwestern wind velocity in the Dvina bay/gulf on the average 4-4.5 m/s is more than the southeastern wind velocity.

In the Kandalaksha bay/gulf and in the throat, restrained by high shores, the winds, which blow along the coast, are noticeably more strong than the winds of other directions - in the throat on 3 m/s, in the Kandalaksha bay/gulf - on 1.5 m/s. In the Kandalaksha bay/gulf this difference is less expressed, since due to strong friction, caused by the large brokenness of the coasts of the bay, especially Karelian, and by the presence of many skerries in the bay, the winds here are generally weak.

Given data attest to the exceptional diversity of the physicogeographical conditions on the coast of the White Sea. The account of these conditions during the determination of coefficients k for different points makes it possible to in more detail forecast

the wind in this region.

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